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Some Clinical Problems of Horse Breeding*

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At the outset of this paper, I must plead guilty—as must most of us who have specialised in a particular subject—to trying to persuade you for a short time to regard horse breeding, with its various problems, as the most important ramification in clinical veterinary medicine.

Each of us present has his own main interest, and while I recognise that some of you will have little occasion to ponder the difficulties which beset the veterinarian working on the stud, still I hope that by bringing before you some of the major and minor obstacles to high fertility percentages, you may be able to put forward some experiences of your own which will stimulate discussion, and give us some of the pointers from which most successful clinical experiments arise.

Horse breeding is as fascinating a subject as any—from the point of view of the owner who, in the absence of real genetic rulings, can exercise to the full his own theories—from the point of view of the stud groom, the backbone of the industry, on whom the future working life or racing career of the foal so largely depend—and from the point of view of the veterinarian who must have the confidence of both owner and stud groom, and without whose co-operation he can achieve nothing.

This afternoon I fear that most of my observations and theories, for I warn you that I propose to trail my coat most shamelessly, must refer to the Thoroughbred in particular, simply because my experiences are mainly in this field, and some at least of our headaches do not apply where hunters and heavy breeds are in question.

Thoroughbred breeding is of necessity somewhat artificial since the demands for "forward" two-year-olds dictate a short breeding season which extends from February 14th to June 14th; indeed, many owners refuse to have their mares covered after June 1st: in consequence, the two months most favourable for short heat periods and regular ovulations are lost to us. Nature, when left to herself, is the perfect clinician, and when our seasons are at variance with her own we must expect the difficulties which we encounter, nor are we ever disappointed. Year after year we hear the same request from the owner of an empty mare arriving at stud: "Can you help me to get my mare to stand early, as I dislike May foals?" Year after year the mare resists all attentions until late in May or early in June, when she holds to a service in that period.

One is frequently confronted with the very high fertility percentages of wild pony breeds in this country—90 per cent. is not unusual among the Welsh ponies of Radnorshire—while 70 per cent. is the average in Thoroughbred circles. It must, however, be remembered that a mare in the Welsh mountains seldom lives longer than 12 to 13 years and that this is the age at which most thoroughbreds are in the middle of their stud careers and by breeding one or two winners have only just proved their value as brood mares. These mares at 15 years and upward are still at the stud; their owners are anxious to breed from them and at the ripe old age of 20 or more, one is often asked: "What are her chances of breeding again. I do so want 'one more filly' from the old mare." These old mares, unfortunately, contribute much to reduce the overall fertility percentages in thoroughbred breeding; and while exceptions occur, good racehorses are seldom bred from mares over 17 years old.

Conformation of the hind quarters further militates against regular breeding in light types. In draught and pony mares the upper commissure of the vulva is seldom more than half an inch higher than the pelvic floor. In the faster breeds, thoroughbreds and hunters, the vulva is placed much higher and the danger of aspirating air, dust, detritus and consequently infection into the uterus, is greatly increased. The fact that *maiden* mares sometimes have to be stitched before they will breed is sufficient evidence of this fact.

Furthermore, there are recognised certain tap root mares whose descendants in tail female are naturally "shy" breeders, as for example, the descendants of FIFINELLA—this family characteristic being handed down as in other animals. Often these mares come from high-class ancestors, are keenly sought by stud owners, and naturally cause profound disappointment when their records at stud are irregular.

Such, then, are the ever-present hazards which militate against the stallion's record in the stud book. Nature is contravened, rather than courted; mares are kept at stud longer than good breeding chances warrant; the very conformation of light breeds increases the risk of genital infections and genetic influences are always present.

To maintain a reasonably high fertility percentage, owner, stud groom and veterinarian must work in close co-operation, not only during the short breeding season of four months, but throughout the year, so that every mare visiting a stallion—or which the stallion visits—may be in such general health and reproductive fitness as to have the best possible chance of proving in foal.

The system adopted in certain studs in the United States and Argentine Republic, where a veterinarian is kept as a permanent member of the staff with full supervision of all stud duties—feeding, covering, foaling, paddock management, etc.—is ideal, but its expense is precluded unless several stallions are kept at one stud or the owner is not paying British income tax.

Distance in many parts of this country further hinders the practitioner from giving as much attention as he would wish to the stud farms in his area. The studs are seldom on his doorstep and, moreover, are often 15 to 20 miles removed from each other. We are fortunate in Newmarket in having the industry centralised within a small enough radius to give that close supervision to individual mares which we find necessary where ovarian or other abnormalities in the oestrous rhythm are manifesting themselves.

Each of the three types of mare—barren, maiden, and foaling—is capable of presenting clinical problems of its own: and I propose to take each one separately and mention the different disorders associated mainly with that type, though it must be remembered that these will to some extent overlap.

Barren Mares

The barren mare (*i.e.*, the mare who did not have a foal the previous year) presents us with our major problem. She may, of course, be perfectly normal—many are; she may have behaved abnormally one season and conduct herself with textbook regularity the following year, but from past knowledge and bitter memories, the owner of a successful stallion regards the barren mare with a somewhat jaundiced eye.

These are the mares in which ovarian disorders are commonest and where genital infections should be sought at the outset. These latter should be eliminated even before the mare has left to visit the stallion.

October and November are the months when owners should have all their mares examined—this allows the following season's matings to be arranged well in advance and the practitioner can form his opinions on those which prove empty.

Because a mare has no discharge, does not mean that she is not aspirating air. The vulva may be firmly closed during the winter months, yet when somewhat relaxed during the season, and when even more extended with the mare in oestrus, bacteria may well enter and set up a temporary infection. It should be remembered that the condition of a mare may determine whether or not she is windsucking—when the quarters are drooping, the lips of the vulva fall inwards and air is aspirated. Cervical swabs will indicate the presence or absence of infection. If this is the case, the probability is that the infection is "mixed" with equine haemolytic streptococci predominating.

Suturing will probably prevent further aspiration of air and dust and serve to clean up the discharge, but it must be remembered that eight to nine weeks' rest may be necessary before the mare is fit for service.

It is an interesting point that pure cultures of equine haemolytic streptococci can be grown from swabs taken round the vulvae of normal healthy mares at any season of the year, the bacilli being apparently saprophytic until the mares' health drops below a threshold value or the mucosa loses its moisture by the constant aspiration of dry air.

When suturing the vulva does not clean up the infection, uterine irrigation with antiseptic agents can hardly hope to succeed; the solution remains *in situ* too short a time unless repeated at frequent

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intervals, and in any event probably never penetrates to the crypts of the cervical and endometrial glands where the bacilli are ensconced.

Success has been claimed by some authorities in treating these obstinate cases by implanting the mare with large doses, *i.e.*, 1 gramme stilboestrol and leaving the tablet under the skin for several weeks on end. They claim that under this treatment the discharge either clears up while the implant is acting, or shortly after its removal. These implants do undoubtedly cause a vast outpouring of secretion from the endometrial glands which helps to improve the tone of the uterus—and if the reason for the infection be, as they declare, oestrogen deficiency, then something may be said in favour of this form of treatment. But the side effects of oestrogen implants are profound. The mare first enters a state of oestrus, which becomes accentuated until, after a variable time, the absorption of stilboestrol brings about male behaviour and the mare takes on stallion characteristics, which include mounting other mares in oestrus, raising the upper lip and the acquisition of a stallion's crest and voice. Pituitary function is depressed, follicle development is inhibited and the ovaries shrink to mere hazel-nut size and become hard in consistence. Much time is lost in waiting until the ovaries are restored to normal after the removal of the implant.

These light but persistent infections do not, in my opinion, call for this type of treatment until chemotherapeutics in the form of penicillin have been employed. This is surely the rational form of treatment, and where the infection is of streptococcal or staphylococcal origin, good results may be hoped for. At present the Friedlander bacillus remains obdurate both to penicillin and the sulphonamides. We await with interest the release of streptomycin for treatment of this type of infection.

Ovarian Dysfunction

Ovarian dysfunction presents us with our largest number of cases during the breeding season. The problem is made more difficult by the fact that the mare may have behaved quite normally in the past, and that clinical examination of a barren mare during the winter months with the ovaries in an anoestrous condition may reveal nothing. It is made still more difficult by the fact that the clinician is often not asked to examine the mare which has been behaving abnormally until well into May, when there are but three or four weeks left to treat the case. This in no way reflects blame upon the stud manager or stud groom, who have probably been waiting for a six weeks' spell of frost and north-east wind to end and give their empty mares a chance.

What are these ovarian dysfunctions which contribute as much as 80 per cent. of our clinical cases during the breeding season?

Barren mares present us with the vast majority of these cases, which may be headed by the anoestrous type. For convenience sake, we may divide these mares into two groups: anoestrus with follicle development, and anoestrus without follicle development. The first type is more commonly met with during the breeding season. On rectal examination one ovary contains a follicle 3 to 4 cm. in diameter, and the ovaries are of the spongy consistence expected at this time of the year. The cervix is dry, firmly closed and pale in appearance, the uterus small and flaccid. The secondary sex organs are obviously not receiving oestrogens either from the ovarian stroma, or from the follicle present. About 70 per cent. of these cases will respond within 48 hours to a moderate injection of stilboestrol in oil. The quantity will vary between 10 to 15 mg. in barren mares, with slightly lower doses for maidens, which have smaller uteri. Ovulation generally occurs spontaneously during the induced oestrus, but may be ensured by an intravenous injection of 1,000 I.U. pregnancy urine extract.

The mode of action of stilboestrol seems to me to be that of sensitising the uterus, vulva and vagina to oestrogen. This is normally performed by an active growing follicle or direct output from the ovarian stroma. In the absence of this oestrogen output, the follicle grows and sometimes, though not often, ovulates without the mare coming in oestrus. The stilboestrol acts purely on the accessory organs and plays no part in the further development of the follicle. This further development may result from reflex stimulation of the pituitary to release luteinising hormone by receptor endings situated in the cervix or endometrium or both—these being themselves activated by the distention of the glands under oestrogen or directly stimulated by the humoral method.

Anoestrus without follicle development has in the past presented stud managers with one of their greatest difficulties. Given a cold early spring, empty mares do not shed their coats until mid-April or even later. Many authorities have noted a close relationship between coat shedding and the appearance of oestrus.

In an experiment conducted in 1946 to terminate anoestrus in mares with artificial lighting, it was found that the regeneration of stromal tissue in the ovaries began within hours of the first noticeable signs of coat shedding. The mechanism which brings about coat shedding is as yet imperfectly understood, though the pituitary and thyroid are believed to be concerned. One possible explanation may be that with the improved weather conditions the need for thyrotropin from the pituitary to maintain thyroid activity may be diminished and the pituitary is then free to liberate gonadotropins. In the normal event, follicle growth follows closely upon increased stromal development and oestrus ensues. Sometimes, however, the sequence hangs fire and the mare does not come in heat for some weeks after losing her coat.

On examination the ovaries are generally of soft consistence, and one or two follicles of 1·5 to 2 cm. diameter may be present.

Stilboestrol treatment is useless in these cases since no follicle of adequate size is present—and the best chance of success lies in stimulating the receptors in the uterine mucosa and cervix in the hope of causing reflex release of gonadotropins from the pituitary.

In the past these cases have been treated with almost every conceivable hormone, also without success. Ovarian massage had its admirers, and when these handled the cervix and uterus, a percentage of mares came in season.

The injection of progesterone, pregnant mare serum, stilboestrol or other oestrogen in these cases seems purely empirical, though Russian workers have claimed success when raw serum from mares, 70 to 80 days pregnant, has been injected into anoestrous cases. In these mares, however, doses corresponding to 80,000 I.U. of proprietary preparations were employed, doses which in everyday practice are out of the question.

The implantation or grafting of ovarian tissues into barren mares, as I understand it, can only be described as licensed charlatanism. To implant ovarian substance subcutaneously, which must lose its oestrogen, and which can never hope to enjoy a blood supply from the recipient, is so far removed from proper therapeutics as to be laughable.

That the condition of the mare plays an important part in conception cannot be disputed. There is a firm belief among stud grooms that an empty mare should not be fat if she is to be got in foal without difficulty. This has resulted in mares arriving in such a poor condition that they do not shed their coats until a month to six weeks after the normal time and never come in season until a few days before they are due to be sent home.

This superstition can perhaps be explained by noting the behaviour of mountain ponies, which of all equine breeds are perhaps most near to nature. They are kept under similar conditions and allowed to run with the stallion and the conception dates of barren mares are almost always within close limits. This year a group of ten experimental ponies were brought up from Wales to Newmarket, allowed to run with the stallion and put on land where the grass was three weeks more forward than that which they had left. Seven of the ten mares became pregnant in a space of ten days, beginning three weeks after their arrival. These mares were in an ascending plane as regards their condition, and if one examines the state of affairs existing to-day in thoroughbred studs the same conclusions may be drawn.

Empty mares arriving in only moderate condition are in a perfect receptive state for the stimuli which excite the reproductive system; for example, new grass, longer hours of daylight and warmer external temperatures, when these are available, which may not be for some weeks after their arrival.

The mare which has been really well done all the winter reaches the stud in March and is promptly treated as a barren mare, for whom no oats are available. She is therefore going back in condition when the stud groom is hoping to cover her, and takes a correspondingly longer time to respond to nature.

Mares should reach the stud in hard condition, not carrying too much or too little flesh, so that they may take every advantage of the spring grass when this arrives.

In the past, "cystic ovaries" provided the practitioner with an explanation for a number of his cases found not to be in foal. When mares are examined during the months of October and November, one ovary will often contain a very large follicle—5 cm. in diameter or even larger. This, in former days, was religiously punctured in all good faith and the mare then passed fit for breeding.

Large numbers of normal barren mares push up one of these outsize "follicles" towards the end of the breeding season; these do not ovulate, and as long as the blood supply to the ovary remains sufficient, they persist. When anoestrus develops, however, and the blood flow through the ovary diminishes, they regress and subside, nor do they recur the following spring.

True cystic ovaries are much more difficult to recognise during the autumn and winter months. The mare may not appear to have any marked abnormality on rectal examination, the history being simply one of barrenness during the past one or two seasons. On the strength of such examination, the owner takes an expensive nomination for his mare and then the trouble begins. These mares generally enter a prolonged oestrus in mid-February or early March and continue to show heat periods of varying durations until the end of the breeding season. Dioestrus may last from a week to a

month, since these cases do not ovulate, and there is no corpus luteum to determine the cycle length.

On rectal examination, both size and consistence of the ovaries are abnormal. The glands are enlarged and feel like a bunch of unripe grapes. The surfaces are studded with a mass of small cysts from 1 to 2 cm. in diameter, which may number 30 to 40 in each ovary. These are the true cystic ovary cases and at present no form of treatment offers any hope of success. They are generally found in mares 15 years old and upwards, and the examiner must be chary of giving a clean bill of health to aged mares with a bad history during the preceding two or three seasons which show no clinical defect when seen during the winter months.

Where a single large cyst is found during the season, it may be punctured and the mare generally gives no further trouble. Occasionally this occurs with a case which has been injected with stilboestrol, and more than half a pint of blood-stained liquor is drawn off when the cyst is tapped.

Maiden Mares

Maiden mares behave similarly as regards anoestrus but present us with a further abnormality. This is immaturity and is probably responsible for more cases of barrenness than is generally recognised. The development of the ovary in the mare is quite different from that in other domestic animals, and while some mares become pregnant as yearlings, others may not produce mature follicles until they are five years old or even more. In spite of this, maiden mares consistently have the highest fertility percentage of all types but because of temperament difficulties in the covering yard, few studs are willing to accept them for mating to valuable stallions.

Foaling Mares

The foaling mare is sought by every stallion owner in spite of the fact that a mare with her first foal is most irregular in her oestrous behaviour, and all concerned with horse breeding are familiar with the "every other year breeder," which seldom shows to the teaser when suckling. These mares present a problem of their own which is, in the majority of instances, at present insoluble.

Anoestrus during lactation is a common feature in many breeds and is apparently due to reflex inhibition of the pituitary from secreting gonadotropins—the receptor nerve endings being situated in the teat substance and stimulated by pressure. It can be very largely controlled in cattle by restricting suckling to three daily periods and separating the calf from its dam in the meanwhile. The temperament of brood mares precludes this measure being adopted, and, in consequence, many mares do not come into oestrus until shortly after their foals have been weaned.

A few of these mares do have silent or physiological sub-heats and may be successfully covered if examined twice weekly during the season, and put to the stallion when typical clinical signs of oestrus are evident.

There are, however, very few foaling mares, including those just mentioned, which will not show to the teaser at the "foal" heat. The liberation of gonadotropins from the pituitary after parturition is strong enough to overcome the lactation inhibition and mares with bad breeding records should be carefully checked through what may be their only heat period before weaning.

Incidentally, the mechanism governing this flood release of gonadotropins after their suppression during pregnancy seems strong enough to overcome any inhibiting factors. In 1946, oestrus was induced in four New Forest pony mares during late January and early February by means of artificial lighting. The mares were inseminated and foaled down during the cold spell of last year, in the snow, with no hand feeding supplied. Three of the four became pregnant at the foal heat to a stallion running with them.

Twin Foals

Mares which give birth to, or abort twin foals, cause considerable financial loss to their owners, and when one considers that individuals may conceive twin pregnancies on several occasions during their stud careers, the importance of preventing this condition becomes evident. When a mare is well recognised as a "twinner," rectal examinations are performed before she is covered and provided only one well developed follicle is present, no steps need be taken. If two large follicles are detected, one is allowed to ovulate, the other punctured *per vaginam* and the ovum thus prevented from reaching the Fallopian tube. It must be remembered, however, that because only one follicle may have been detected at the time of service, nevertheless, twin pregnancies may still ensue. With a very fertile stallion whose spermatozoa remain viable for four days, a second fast-growing follicle may readily ripen and ovulate before the sperm have died and a second rectal examination should be performed two days after covering. Occasionally two 3 cm. follicles may ripen so close together as to be mistaken for a single outsize follicle and disaster occurs in spite of a confident report from the practitioner. There is small danger of twin pregnancies to services before late April or early May. Conditions are unsuitable for the ripening of two follicles until late in the season, but there can be no doubt that were the thoroughbred breeding season extended to the end of June, the percentage of twin pregnancies would be very considerably increased. Of some eighty mares whose ovaries were examined *post-mortem* in the slaughterhouse during the months of June and July, no less than 27 per cent. were found to have had double ovulations during the preceding oestrous period. The fact that heavy breeds do not show a higher percentage of twins is probably explained by the single service during each heat as compared with two or even three in thoroughbreds. Double ovulations are rare in pony breeds, where natural conditions and environment are not supplemented by hand feeding and housing during the winter months.

No practitioner can hope to be of real service to horse breeders unless he has familiarised himself with the technique of rectal examination, which can best be perfected in the slaughterhouse, where findings can be confirmed at *post-mortem* examination.

Thus the clinician can differentiate between the follicle which is still growing, and that which is softening to ovulate; he can judge the follicle which can be made to ovulate as opposed to that which is not yet ripe enough; he can detect the fresh ovulation—confirmed by the pallor of the cervix and vagina—while the consistency of the ovaries will give him helpful information on the activity of the pituitary.

The tone of the uterus will help him to gauge the stage of the cycle at the time of examination, the turgidity and oedematous feel at pro-oestrus can be detected, as can the firm consistence denoting the presence of an active corpus luteum, while anoestrus is accompanied by complete flaccidity with the walls collapsed on each other. It is, further, of considerable advantage to be able to diagnose pregnancy at an early stage—mares which are apparently holding to services in February and March can then be checked after six weeks, and, if in foal, sent home to relieve the stud paddocks and, if empty, can be treated so as to have them covered again and give the stallion a chance of improving his fertility percentage figure. The value of early pregnancy diagnosis is perhaps best demonstrated by remembering that four empty mares will reduce a horse's percentage by 10 per cent. and that while a 70 per cent. average is considered satisfactory, 60 per cent. is frowned upon by prospective subscribers.

In accepting your kind invitation to speak to you this afternoon on my own subject, I have had to omit points of interest to all of us, but I have tried to offer explanations for certain phenomena of oestrous behaviour which when suppressed or abnormally displayed, may confront the clinician with some of his difficulties.

The very large sums of money associated with the thoroughbred industry have encouraged empiricism in this section of practice. One cannot condemn too strongly such practices as the implantation of ovaries, uterine insufflation of oxygen with no explanation of its possible mode of action, and the intramuscular injection of 10 to 15 c.c. of blood withdrawn from the jugular vein of the mare at the time of service, to name a few of the measures employed.

I have postulated neural reflexes to account for oestrous behaviour in the mare. In the absence of critical investigation, these suggestions must remain unproven, and I await your comments with interest in the full knowledge that none of you will make me appear more foolish than some of my mares have done in the past.

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Discussion

Mr. SWABY opened the discussion in the following terms:

We are indeed indebted to Dr. Burkhardt for coming here to-day and giving us this most up-to-date and enlightening address, and, on your behalf, I would congratulate him on the success he has attained. Hormones and hormone treatment are very much in the limelight these days, but much has yet to be done before the whole "truth and nothing but the truth" is known to us. Dr. Burkhardt says thoroughbred breeding is of necessity somewhat artificial since the demands for forward two-year-olds dictate a short breeding season and in consequence the two months most favourable for short heat periods and ovulations are lost to us. We have all dealt with nature long enough to know she will not tolerate continued interference, and yet we persist in our impious designs that men may reap richer rewards, in shorter periods of time. Yet we have all seen the late foal come forward to beat the rest.

Dr. Burkhardt says conformation of the hind quarters in the lighter breeds militates against regular breeding. Does he mean with reference to the upper commissure of the vulva only, or to the "set of the entire pelvis"? I should be grateful if he would describe in detail *his method* of suturing the vulva in maiden mares, as by producing scar tissue, would he expect greater damage by

tearing, etc., at the time of parturition? What is the hereditary factor which is handed down to the mare's descendants? Is it glandular or anatomical?

Dr. Burkhardt asserts that to maintain a reasonably high fertility percentage, owner, stud groom and veterinary surgeon must work in close co-operation—not only in the breeding season, but throughout the year. How seldom is one called in before the mare has probably returned to service several times and the breeding season well advanced before the owner or groom realises something is wrong and one is expected to work wonders in a short time: here I agree that distance often militates against proper and continued attention being given at the right time. We cannot all live on the premises and must do our best in the circumstances and remember we have to deal with an individual and not a "mass-produced" object. I would agree with him that "barren mares" present the major problem and that they should be examined well in advance of the breeding season; and he suggests October and November as the best months so that the following season's matings can be arranged. Would he kindly describe what he considers the best method of carrying out such an examination and his procedure in dealing with a case where infection has supervened?

It is indeed interesting to note that pure cultures of equine haemolytic streptococci can be grown from swabs taken from around the vulvae of normal healthy mares at any season of the year, and that the bacilli are apparently saprophytic. When suturing of the vulva does not succeed in clearing up this infection, and irrigation with antiseptic agents is not expected to succeed, and the implantation of oestrogens causes such profound alterations as to offset their use, would penicillin in oil be more effective in such conditions? I well remember years ago introducing what I thought was a very weak solution of iodine into the uterus of a valuable thoroughbred mare with a uterine discharge; she became almost uncontrollable and threw herself about violently and had to be given sedative treatment, to prevent further injury to herself. Before the last war I was privileged to conduct Dr. Way, of the U.S.A., round several studs where he carried out pregnancy diagnosis in mares, and he informed me he used azamine in mineral oil for uterine infection; has Dr. Burkhardt any experience of this? I have used solutions of entozon and saline solutions for such conditions with successful results, but have wondered if the mare got better in spite of the treatment, rather than because of it! Stilboestrol has proved a very useful drug, but it must be used with care and discretion. The experiments conducted with artificial lighting are interesting but cannot yet hope to be a practical proposition generally, and it is possible that in the past so many hormones have been injected into mares without proper regard for their use, as to cause a mare to be sterile at least for that season alone.

The condition of the mare at mating time has always caused controversy. How often are mares left out rough through the winter without adequate rations and sent by owners to the stud in no fit condition for mating, and the owners grumble because the foals are late. This depends entirely on stud management. Has Dr. Burkhardt any theories with regard to the harmfulness or otherwise on the "condition and receptive state" of mares which have grazed on rich pastures heavily dressed with superphosphate or other artificial manures? One often hears that such grass has a detrimental effect on mares and foals, but how, one is not informed. Is there any foundation for this belief? What stage of oestrum does Dr. Burkhardt consider to be the optimum time for service? It is usually stated to be the fourth or fifth day. And why do some mares show oestrum when well advanced in pregnancy? Is this hormonal imbalance? Whilst agreeing that maiden mares have the highest fertility percentage, owners of valuable stallions are chary about accepting them, and I would say that vicious and excitable mares do not conceive readily. The mare that will not breed when suckling seems to have been known from time immemorial—can it be that the hormonal fraction of the pituitary which is responsible for the "let down of milk," temporarily outweighs the effects of all others? Dr. Burkhardt states that mares that give birth to, or abort twin foals, cause considerable financial loss to their owners; I would have liked him to elaborate more on this interesting question, regarding the causes, diagnosis and treatment. I earnestly hope that his department in the Veterinary Educational Trust will take up this matter and fix some standard of titre for the agglutination test, as one often gets very diverse reports on blood samples taken from mares which have aborted, and one is left wondering whether the abortion was due to the particular infection or not. Such occurrences seriously upset the stud and its personnel—as do mares aborting within a few hours of arriving at studs for service after foaling, and one hopes that a universal titre will be made available as a standard for all.

The work which Dr. Burkhardt and his colleagues are undertaking will be watched with great interest and no doubt they have contributed and will continue to contribute, more to this most interesting subject. We wish them every success in their work. I have only touched on certain aspects of this very comprehensive paper, and I am sure there are many who wish to add their own contributions.

Mr. R. H. Smythe thanked the essayist for a very masterly address on a rather specialised subject. The majority of those present were more closely concerned with the heavier type of mares. These presented a number of similarities and an even greater number of dissimilarities.

Comparing infertility in the mare with the corresponding condition in the cow, one had to remember that the mare more closely followed the dictates of nature in that she was only called upon to provide milk for her foal for a normal lactation period instead of having to meet the requirements of a street of houses for ten months out of every twelve. Since the abnormal physiological stress was absent in the case of the mare, the complications dependent upon hormone imbalance were by no means so marked. The causes of infertility in the mare were therefore less numerous and it was far easier to diagnose the true cause although it was not always so easy to provide the remedy. In the mare one usually considered that the optimum time of service was 48 to 24 hours before the close of oestrus. This necessitated some knowledge of the mare's own particular cycle as mares varied very considerably in the duration of "heat." Unlike the wealthy thoroughbred owner, the working farmer was dependent upon the travelling stallion, and as this overworked animal made his appearance on one particular half-day each week, most of the mares, if they stood to service at all, were served either too early or too late with a correspondingly low fertility ratio. He had used prolan at the time of service with some measure of success but on the whole he had little confidence in proprietary biological products. He asked the essayist how long he considered the sperm of an active stallion would remain viable in the Fallopian canal.

Ponies, running wild on moorland, usually showed a 90 per cent. fertility, but in their case, feeding and exercise were normal and the stallion served at the appropriate time without any restraint being used in the case of the mare.

Apart from the time of service, other factors handicapped mares kept in racing stables, the chief of these being diet and stabling. Concentrates and a high protein ratio were all very well in some ways, but dried fodder could never compare with good grazing as a source of metabolites and it lacked the green juice which might either contain natural oestrogens or might stimulate the formation and output of hormones essential to ovulation and conception. Of course, some mares did breed without grass. Most of those grazed at all were confined to pastures which were horse sick or of low feeding value.

The value of grass in relation to fertility was in direct proportion to its chlorophyll content. Chlorophyll was the product of sunshine and a really green field, provided that it had not been dressed with artificial manure, indicated the presence of humus carrying the minerals essential to animal fertility.

In cattle, particularly in the Channel Island breeds, all the carotene content of the chlorophyll was not dealt with by the gut wall and a proportion of the carotene and possibly some xanthophyll by-passed the liver and entered the blood stream. It was picked out by the retina, the pituitary, the ovaries and the mammary tissue, all of which were intimately associated with reproduction. Carotene in the ovary could be detected by the reddish-yellow colour it imparted to the sectioned ovary and particularly by the rose pink coloration of the corpus luteum in contrast with the usual chrome yellow. This was particularly obvious during the spring and summer and appeared to exert a favourable influence upon breeding. It was noteworthy that the majority of cows slaughtered during the summer months on account of barrenness lacked this particular coloration but it could almost invariably be observed in fertile and pregnant casualties. Although the mare had a somewhat different mechanism as regards the absorption of carotene, it seemed equally probable that the tissues which in the cow possessed these powers of selecting carotene might, in the mare, have the same ability to pick out the products of grass juice necessary for their full activity.

Increase in the hours of either daylight or artificial lighting had been found to expedite the onset of oestrus in all animals by stimulation of nerves passing from the retina to the brain and from the brain to the pituitary. Naturally, this stimulation occurred at the period of the year when carotene was most abundant, resulting in an increased absorption of vitamin A. When attempting to breed from mares deprived of natural chlorophyll, one could nowadays supply vitamin A by injection and it could be similarly reinforced by vitamins C and E.

He would like the essayist to explain the frequency with which mares aborted in twin pregnancies. Was it on account of the almost continuous ovulation which occurred in some mares during pregnancy? He also asked the possible effect of complete blindness. Would rats from which the eyes had been removed continue to

breed? Could sufficient hormones be secreted without the aid of the retinal impulse?

He also asked for some explanation of the coital exanthema which followed upon the visits of certain stallions.

Had trichomonas yet been demonstrated in the mare?

Mr. G. Gibson asked the essayist whether he would recommend dried grass as a feed to barren mares. Also, whether it was now possible to treat recto-vaginal fistulae satisfactorily and if one could tell if the Fallopian tubes were patent or not.

Mr. Weighton enquired as to what was to happen to the National Stud and what was its benefit to the small breeder, suggesting that its control should pass to the Animal Health Trust. The successful treatment of three barren mares was then described. One mare was irrigated with 1 in 2,000 acriflavine; the second, which was suffering from leucorrhoea, was given 3 oz. of sulphanilamide per stomach tube and on visiting a few days later to irrigate her, the condition was found to have cleared up. The third was suffering from anoestrus and was given three injections at 72-hour intervals of 1,000 units of prolan. She came on heat the day after the third injection, and conceived.

Mr. Eaton: Was there any new treatment for anoestrus in cattle as stilboestrol and P.M.S. were unsatisfactory?

Mr. H. H. Truman asked the essayist whether he had any idea of the benefit of lime to the infertility problem. He, himself, used and fed ground lime freely and had better health in his stud and no abortions. What was the best time of service after foaling? He was now of the opinion that it was better to try on the fifth day afterwards.

Mr. G. L. Beaumont also mentioned the benefit of lime to the stud, and asked whether soil or dust ever entered the uterus where the cervix was patent. He also asked whether a mare would breed satisfactorily after the removal of one diseased ovary. He then went on to describe how five mares which would not breed were eventually destroyed and on *post-mortem* examination revealed large ulcerated areas in the horns of the uteri. What was this condition? He finally asked Dr. Burkhardt what was his opinion on feeding mineral mixtures.

Mr. W. Kochan enquired what was the proper interval to take a maiden filly out of training and then serve her.

Mr. Noble asked Dr. Burkhardt for his comments on using a speculum in artificial insemination in a stud. He himself had got a big increase in conception rate in the stud when he ceased using a speculum as air was no longer aspirated.

The Reply

In his reply, Dr. Burkhardt said that in his opinion, the set of the pelvis did not militate against regular breeding in thoroughbreds. However, in older mares which had bred a number of foals, the uterine ligaments were stretched, with the result that the uterus was suspended at a lower level. This appeared to hinder the removal of natural secretions and might even allow of the backflow of small amounts of urine through the cervix during oestrus with consequent mild catarrhal inflammation.

Maiden mares could best be "stitched" where this was found necessary, by simply shearing the edges of the upper vulval commissure to the required depth and uniting them with Michel clips, placed in complete apposition to each other along the incisions. It must be looked upon as a last resort to be performed only when every chance had been given to the mare, and one must remember that tearing was bound to recur at each successive parturition and that the vulva must be re-stitched within 24 hours of foaling.

Penicillin treatment had given encouraging results in those mares suffering from endometritis and cervicitis caused by penicillin-sensitive organisms, but dosage and duration of treatment were not yet fully determined. It had, however, to be remembered that inadequate dosage or injections spaced too far apart were worse than useless as they might well render the bacillus penicillin resistant. He had no fertility percentages of mares kept on land heavily dressed with artificial manures and had an open mind on this subject.

As a general rule, the optimum time to cover mares was from 48 hours before, up to the time of ovulation, while the Russians claimed to have obtained good conception results up to ten hours after ovulation. An injection of 1,000 I.U. pregnancy urine extract could be given at the time of service to ensure ovulation within 48 hours, provided that the follicle was sufficiently developed at the time of injection.

Some mares did undoubtedly show oestrus during pregnancy, and this was not surprising when the condition of affairs occurring in the ovaries was considered.

The corpus luteum of pregnancy, which in other animals inhibited oestrus, degenerated at an early stage in the mare, to be followed by a large crop of follicles which luteinised, and some of these actually ovulated during pregnancy. Under such conditions it was not surprising that mares "showed" to the stallion when in foal. Professor J. A. Nicholson, of Dublin, who examined large numbers of urine samples annually for pregnancy, had told the speaker that an appreciable number of mares were pregnant to a service earlier than that believed, as judged by their urinary oestrogen content.

The hormonal imbalance of lactational anoestrus seemed to be one of non-secretion of some of the gonadotropins, for while 2 cm. follicles could be palpated in many of these cases, the follicles did not develop to the ovulation stage and simply regressed to be followed by others which behaved similarly. Such mares very often came into oestrus within a short time of their foals being weaned.

The fact that many twin foals were aborted was usually explained by the lack of adequate nutrition for the extra foetus. When abortion occurred one foetus was often considerably smaller than the other and had been dead for several days or weeks. Putrefaction and the absorption of the surrounding fluids had stimulated the expulsion of both foetuses from the uterus.

When considering agglutination titres of *salmonella abortus equi*, it must be remembered that the personal factor in reading and interpreting laboratory tests was just as important as that factor in the field. According to Dimock, sera from normal mares could agglutinate at dilutions of 1 : 300.

The optimum treatment in serving heavy mares where the stallion could only cover once during a heat period was the injection of 1,000 I.U. pregnancy urine extract, *e.g.*, pregnyl (Organon) or gonan (B.D.H.) at the time of service.

Grass probably acted on the reproductive organs through its nutritive value to the mare as a whole. Together with light and warm external temperatures, grass comprised a vital factor in the resumption of short heat periods with regular ovulations.

Pony stallions achieved their high fertility rates through a number of circumstances. The mares were young and of good breeding conformation and were kept under completely natural conditions. If the covering time was important—and he felt sure that it was—the stallion was on hand throughout the period, while the compatibility of stallion and mare was assured. In well-managed pony herds there were ample horses for the number of mares and the "season" lasted from late April to the end of September.

True coital exanthema occurred in thoroughbred studs and was thought to be due to a virus infection which might well be fly-borne. It was transmissible to the stallion and the lesions in mares were difficult to detect in the early stages. Small papules occurred on the inside and outside of the vulva, which were replaced by depigmented areas after the infection had died out. The speaker had never heard of a case of trichomoniasis in the mare.

Artificial lighting appeared to act through the retina via a nervous path to the pituitary. Blind mares did come in oestrus, but the fact that the rods and cones were not functioning did not mean that light rays could not traverse the eyeball and reach the optic nerve.

Dr. Burkhardt thought that dried grass would be a most valuable adjunct to mares during the early part of the covering season, its only drawback being its almost prohibitive price under present conditions.

Farquharson, in America, operated with fair success on cases of recto-vaginal fistulae, the prognosis depending upon the extent of the injury and duration of the condition.

It was impossible to determine whether the Fallopian tubes were patent in the mare by the Rubens test, as in the human and the cow. The uterine ends of the tubes were sealed by small valves which effectively prevented the passage of gas from the uterus, and the practice merely resulted in causing acute discomfort to the subject.

The question of the future of the National Stud was at present under review. The Minister of Agriculture had recently given a reply on the subject in the House of Commons and at the last meeting of the Thoroughbred Breeders' Association it was proposed that Lord Rosebery should, if invited, consider the whole question with the Minister.

The treatment of anoestrus with prolan had not given results which justified its recommendation in clinical practice. A few cases did apparently respond, as was the case with pregnant mare serum, but the vast majority of mares remained unchanged and one was forced to the conclusion that the result was in spite of rather than because of the injection or that distilled water would have produced the same result.

Mineral deficiencies did undoubtedly play an important part in reducing fertility rates where the imbalance was pronounced, but until more work was done on the mineral requirements and contents in the horse we should have to work somewhat in the dark.

Enlarged ovaries were met with in young mares for the most part. They were pathological, affected only one gland and were known as granulosa cell tumours. They varied in size from that

of an ostrich egg to that of a football, and to date the appropriate treatment had been to remove them *per vaginam*. The mare would generally breed quite successfully from the remaining ovary. He had not encountered uteri with discrete ulcerated areas at *post-mortem* examinations.

Maiden mares could be taken straight out of training if desired and covered when they came into oestrus. Sometimes it was done to try and quieten a temperamental filly, which was then put back into training and raced the same season.

Most stud grooms preferred to cover mares on the ninth day after foaling if possible, but the proper course was to cover a mare when she showed well to the teaser, provided that her genital organs had recovered from parturition. Bruising, with consequent streptococcal infection, should be looked for and no mare should be served until she was clean and healthy.

It seemed definitely to mitigate the chances of success when a speculum was used for insemination. The aspiration of air and dust particles was to be avoided at all costs.

Where mineral supplements and cod-liver oil were fed, experiments with cattle seemed to indicate that the last three months of pregnancy were the most important, and he thought that this would be found to apply in the case of the in-foal mare.

CLINICAL COMMUNICATION

Traumatic Pericarditis in the Bovine

P. S. BLIGH, M.R.C.V.S.

WINCHESTER

Subject.—Six-year-old Shorthorn cow, six months in calf. She had been "off colour" for three days, and the bowels had acted only twice during that period.

Symptoms.—The animal was down, and grunting on each respiration. Her general appearance was dull; there was a slight discharge at the inner canthus of each eye; her extremities were cold; the mucous membranes were normal. The temperature was sub-normal (99·8° F.) and the breathing was shallow and fairly rapid.

Auscultation of the heart revealed only one regular heart sound, which was remarkable for its clarity, volume, and the wide area over which it could be heard. Auscultation as far back as just anterior to the external angle of the ilium produced a distinct heart sound; it was particularly apparent when listening to the rumen for sounds of peristalsis, which were absent.

The pulse was weak, there was no evidence of a jugular pulse and no oedema of the dewlap.

Rectal examination revealed fluid faeces. When the rumen was felt through the bowel wall a distinct pulsation corresponding to the heart beat could be noted.

Diagnosis.—Traumatic pericarditis, the wide diffusion of heart sound and the pulsation of the rumen being due to adhesions between rumen, liver, diaphragm, and pericardium. The owner was advised to have the animal slaughtered.

Post-mortem Findings.—The reticulum was adherent to the liver and diaphragm, there being no apparent abscess formation. The pericardium was adherent to the lungs and diaphragm and there were also very considerable adhesions between the pericardium and the sternal region, in which two 2-inch pieces of wire were found.

The pericardium, which was not thickened, contained about ½ gallon of gelatinous fluid. There were no fibrinous deposits on the pericardium or heart wall.

Remarks.—This case was of particular interest to me, owing to the ability to palpate the transmitted heart beat per rectum. I should be interested to hear if other readers have experienced this, and whether they consider it of common occurrence.

Most disturbing were the widespread complaints about the poor quality of many of the bulls that were exported both to Rhodesia and to South Africa in recent months. We saw some of these bulls, both in quarantine stations and on individual farms, and I am bound to say that many of them reflected little or no credit on our livestock industry.—R. H. HUDSON, M.P., farmer and war-time Minister of Agriculture.

ABSTRACT

[The Effect of Environment on the Survival of the Free-living Larvae of T. colubriformis and other Nematode Parasites of Range Sheep. SEGHETTI, L. (1948.) *Amer. J. vet. Res.* **9.** 52.]

The development of nematode infections (predominantly *Trichostrongylus colubriformis*) in sheep, ranging on the semi-arid plains of Montana and Dakota, was investigated.

The worm burden acquired by initially worm-free lambs was studied at different times of the year. It was concluded that infection was mainly acquired during May and June, at the time of heaviest rainfall. The range was practically free of the infective larvae of *Trichostrongyles* and *Haemonchus contortus* by the end of the summer, when there was less than one inch of rain in two months. At this period the majority of the worm larvae were killed within ten days.

A proportion of the pre-parasitic stages of *Trichostrongyles*, *Haemonchus* and *Nematodirus spathiger* survived the winter, in the egg or infective larval forms. In the case of *Nematodirus* the free-living stages were very resistant to cold and desiccation.

Water reservoirs, which collected the drainage from infected pastures, were examined for the presence of infective larvae. With the exception of *Nematodirus*, the reservoirs were of no significance as direct sources of infection. However, accumulations of faeces adjacent to drinking places increased the infectivity of the locality.

D. W. J.

REVIEW

[Basic Facts of Health Education. The Pharmaceutical Press, 17, Bloomsbury Square, W.C.1. Pp. 193+vi. Price 7s. 6d. (post 7s. 10d.).]

This book comprises a series of selected articles reprinted from *The Pharmaceutical Journal* on subjects of general or wide interest in the field of public health.

Many diseases are dealt with in an interesting and factual manner, all writers stressing the importance of correct and differential diagnosis as a basis for treatment. The undesirability of the prescribing of various medicaments for the treatment of symptoms as described by a patient to a pharmacist in the absence of a diagnosis is emphasised.

Popular misconceptions regarding some diseases are explained and corrected, and the use of certain laboratory techniques is put in a proper perspective.

While this publication may not be of direct interest to the veterinary reader, it provides much food for thought and stimulates reflection concerning the possibilities of producing a similar volume covering matters of popular interest in the veterinary field.

WEEKLY WISDOM

". . . He had had a good deal of experience in amalgamating separate entities and, if he might say so without conceit, with some success. He knew that in bringing together people who had always been separated and probably antagonistic in many ways two things were needed:—

The first requirement was that the people must have a clear idea of the objectives it was sought to obtain and there must be with it a sound moral foundation.

The second requirement was to translate their general desire for unity—and this was hard to do—into agreements, legislation, and a constructive fabric. It could not be done by the passing of resolutions alone. Resolutions might create the public opinion but they had to be translated into workable machines to give effect. It had to be evolved, therefore, in a manner that was workable, permanent, and sure. . . ."—Mr. ERNEST BEVIN, M.P., House of Commons Speech, May 4th, 1948.

* * * * *

By agreement with the Ministry and the Agricultural Research Council, the Institute of Plant Breeding at Cambridge will transfer, when conditions are favourable, to a site offering greater facilities for development. The Institute will also transfer to an independent Board of Management, comparable to those for Rothamstead and East Malling. Dr. G. D. H. Bell, university lecturer and acting director, has now been appointed director of the Institute.

Questions and Answers

The submission of questions for inclusion in this column will be welcomed: they can relate to any aspect of veterinary work. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

Parasitic Aneurysm in Horses

Q. CCXXXIX.—*Please discuss the symptoms, prognosis and treatment of parasitic aneurysm in horses.*

A.—No particular symptom can be attributed to parasitic aneurysm of the cranial mesenteric artery of the horse, other than possibly the general symptoms of strongylosis and weakness of the hind quarters, unless the presence of *S. vulgaris* larvae is so extensive as to cause direct or indirect interference with the blood supply to a part of the bowel. In that case symptoms of peritonitis and or colic will supervene, usually with fatal results. If the presence of parasitic aneurysm is accompanied by heavy parasitic infestation of the bowel, symptoms of extreme emaciation are witnessed. In cases of uncomplicated parasitic aneurysm neither the blood picture nor faecal examination as such are aids to diagnosis.

Since aneurysms are commonly found in horses on *post-mortem* examination which seemingly have had little effect on the host, the question of prognosis in such cases does not arise; but if complicated by extensive spread into the branches of the cranial mesenteric or other abdominal artery, prognosis is bad. No treatment for such cases can be suggested.

To summarise: uncomplicated parasitic aneurysm is of little consequence; if accompanied by general symptoms of strongylosis, treatment should be accordingly; if accompanied by marked interference with the blood supply to a part of the bowel resulting in embolism and/or thrombus formation, treatment is of little avail.

. . . . . .

Suspected Death by Lightning

Q. CCXL.—*For what evidence would you look if asked to examine a dead animal in a field and suspected to be killed by lightning, in order to satisfy an Insurance Company enquiry? The Insurance Company usually ask if there are any blood changes. What would you expect to find? It is said that a dog or fox will not interfere with an animal killed by lightning. Is there any evidence to support this statement? Would the absence of any burn marks automatically exclude lightning?*

A.—The first piece of evidence which should be established when investigating a case of suspected lightning-stroke—one which is often overlooked—is the occurrence of a thunderstorm at the time of death. Burn-marks, though by no means constant, should always be looked for; their absence does not automatically exclude death from lightning-stroke. The subcutaneous tissue usually has a bluish discoloration, and the blood does not clot, this being the change referred to in the Insurance Company's questionnaire; and putrefaction of the carcase is *extremely* rapid. There does not appear to be any evidence to support the belief that dogs, foxes, etc., will not interfere with an animal killed by lightning: the writer suspects this belief to be on a par with the country superstition that hedgehogs will suck cows as they lie in the field at night.

When possible, the carcase should be removed to a knacker's yard and a complete *post-mortem* examination carried out; most reputable Insurance Companies will, in the established presence of lightning, accept negative findings—*i.e.*, no other detectable cause of death—as evidence of death from lightning-stroke.

. . . . . .

The Modernising of an Existing Cowshed, or the Building of a Milking Parlour

Q. CCXLI.—*Providing the cost would be the same, would you recommend* (a) *the modernising of an existing cowshed, or* (b) *the building of a milking parlour?*

A.—It is difficult to give a direct answer to this question, stating categorically that either (*a*) or (*b*) is the better alternative, as there are so many factors to be borne in mind besides the actual shed and method of milking.

Firstly it must be remembered that a milking parlour does not provide night accommodation. Unless, therefore, the district, and the breed, breeding and feeding of the cows, is such as to make it possible for them to lie out day and night all the year round, some night accommodation must be provided. The existing shed could be used for this purpose, or large covered yards provided. If it is desired to use the latter, the danger of the cows damaging one another by fighting is very real, unless they are dehorned.

The second point to be considered is the relative facility with which the muck may be removed and stored. Mechanical aids are easier to install and use in an orthodox shed, but muck may be removed more easily from the smaller space of a milking parlour. There is a tendency, however, to swill it down the drain; its manurial value is thus lost to the farm, unless it goes into a tank from which it may be removed and used as liquid manure or in the making of compost.

Another disadvantage of the parlour is the difficulty of rationing high-yielding cows according to yields. A greedy cow with a poor yield may be able to eat enough concentrates in the four minutes which milking should not exceed, but rationing cannot be the exact science which it should be if high yields are to be maintained economically.

On the whole, therefore, the arguments seem to be in favour of converting the existing shed. This is a generalisation, but may be a framework round which to build a more detailed consideration of special circumstances.

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Correspondence

Castration of Colts

Sir,—In the answer to the above question (CCXXXVI) the interpreter describes the method which he considers the most humane for carrying out the operation.

The writer favours the method personally but he would not go so far as to say that it was the easiest. In the hands of a young active man the standing operation, rendered humane by infiltration of the cord, is surely the speediest.

We are not all of us young and active and the best method is surely the one which is suited to the individual. The questioner did not enquire about equipment but I have no doubt that he would like a sight of the interpreter's mask.

Unfortunately there is no such mask on the market and one has to improvise. The type in use here is a Cox with the canvas cut off level with the top of the leather tube; at this point an inflatable tube is fitted on the inside but only covering the top and sides. A Zipp closes the bottom. This mask is by no means perfect and one would like to invite manufacturers to consult a colleague near the Metropolis to go into the matter. Unless the appliance is nearly airtight 1½ to 2 ounces of chloroform will not by any means suffice. The interpreter uses a Hausmann Dunn but many have only an ordinary emasculator which has become spread with use and Oeschner's or some other strong forceps have to be brought in to clamp above the instrument.

This is quite safe even with three year olds. A great advantage of the general anaesthetic is that partial "rigs" can be dealt with at the time without the need for a subsequent operation.

Yours faithfully,

Little Orchard, LINDSAY AUCHTERLONIE.
Whatton-in-the-Vale,
Near Nottingham.
May 9th, 1948.

. . . . . .

Head-Shaking in Horses

Sir,—With all due deference, I cannot subscribe to the reply given to query CCXXXIII in your issue of April 17th.

Very rarely, in my experience, has the trouble been due to "irritation from accumulation of wax in the ears."

As I stated in these columns dated August 17th, 1946, chronic cases are, judging by the results obtained by performing infra-orbital neurectomy, due to a form of trigeminal neuralgia.

Yours faithfully,

"Rothiemurchus," J. F. D. TUTT.
St. Cross,
Winchester.
April 19th, 1948.

. . . . . .

So-called "Milk Fever" of Sows

Sir,—In connection with the reply to "Questions and Answers" No. CCXXXVIII I wonder if in recommending the use of pituitrin the writer was confusing the treatment of sows which do not let down their milk with post-parturient fever. Certainly pituitrin sometimes proves very effective in promoting the flow of milk, while sulphapyridine is spectacularly effective in cases of post-parturient fever.

Yours faithfully,

Ministry of Agriculture and Fisheries, P. L. SHANKS.
Quarry Dene, Weetwood Lane, Leeds, 6.
May 12th, 1948.

NOTES AND NEWS

Diary of Events

May 22nd.—Whole-day Meeting of the Society of Women Veterinary Surgeons at the Experimental Farms of Messrs. J. Bibby & Sons, Ltd., in the Wirral, Cheshire. (See Notice.)
May 25th.—R.C.V.S. Voting Papers to be returned.
May 26th.—Annual Meeting of the West of Scotland Division, N.V.M.A., Glasgow Veterinary College, 2.30 p.m.
May 26th.—Annual Meeting of the National Veterinary Benevolent and Mutual Defence Society at Manchester (Grand Hotel), 2.15 p.m.
May 27th.—Annual Meeting of the Society of Veterinary Practitioners, at the Holborn Restaurant, W.C.2, 2.30 p.m.
May 27th and 28th.—Meetings of the Veterinary Hygiene Section of the Royal Sanitary Institute's Congress at Harrogate. (See Notice.)
May 28th.—Meeting of the Royal Counties Division, N.V.M.A., at Reading (Caversham Bridge Hotel), 2.30 p.m.
May 29th.—Meeting of the Biochemical Society at Oxford (Department of Biochemistry, University Museum), 1 p.m.
June 1st.—R.C.V.S. Annual General Meeting.
June 1st.—V.V.B.F. Annual General Meeting.
June 4th.—Meeting of the South Wales Division, N.V.M.A., at Aberystwyth (Agricultural Buildings, Alexandra Road), 2.15 p.m.
June 7th-8th.—R.C.V.S. D.V.S.M. Written Examination.
June 10th.—Annual Meeting of the Lincolnshire and District Division, N.V.M.A., at Peterborough (Grand Hotel), 2.15 p.m.
June 10th.—R.A.V.C. Golfing Society Meeting, North Hants G.C., Fleet. (See Notice).
June 10th.—Meeting of the West of Scotland Division, N.V.M.A., Clinical Club, Glasgow Veterinary College, 7.30 p.m.
June 11th.—Summer Meeting of the South-Eastern Division, N.V.M.A., at Folkestone (The Leas Cliff Hall), 2.30 p.m.
June 11th.—R.A.V.C. Annual Dinner, Grosvenor House, London, W.
June 17th.—Central Veterinary Society's visit to the Compton Field Station of the Agricultural Research Council.
June 24th-25th.—R.C.V.S. Membership Written Examinations.
June 30th.—July 2nd. Meetings of Council and Committees, N.V.M.A., in the Royal (Dick) Veterinary College, Edinburgh.

Sept. 8th to 15th (inclusive).—N.V.M.A. Congress at Southport.

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PERSONAL

Births.—Brown.—On May 3rd, 1948, at Chippenham, to Mary, wife of Philip Brown, a daughter—Sally Mary.

Simpson.—On May 12th, 1948, at Beaufort Nursing Home, London, to Doreen (née Poignand), wife of Charles A. C. Simpson, M.R.C.V.S., Worthing, Sussex, a daughter—Stella Marie.

Tutton.—On May 13th, 1948, at Brackley Cottage Hospital, to Patricia Tutton (née Oddie), wife of Edward A. Tutton, B.V.Sc., M.R.C.V.S., Turweston Manor, Brackley, the gift of a daughter—Rosemary.

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Death.—Wood.—At Truro Royal Infirmary, Sheila Elizabeth, only daughter of Mr. and Mrs. D. R. Wood, Ashby Villa, Tregoney, Truro, age 1 week.

* * * * *

Forthcoming Marriage.—Jones—Earl.—The engagement is announced between Oliver G. Jones, M.R.C.V.S., of Camberley, Surrey, and Audrey Earl (*née* Hull), of Broomhayes, Fleet, Hampshire.

* * * * *

Retirement of Mr. G. Norman Hall.—After 35 years' continuous service, Dr. G. Norman Hall, O.B.E., retired from the Colonial Veterinary Service on May 19th. Formally retired in 1937. Mr. Hall was immediately re-engaged by the Colonial Office and in 1942 was offered the Directorship of the Joint Veterinary Services, Sierra Leone and the Gambia, which post he has held to the present time. Mr. Hall is now proceeding to South Africa for a tour.

* * * * *

Will.—Mr. Frederick Tonar, M.R.C.V.S., of 2, Oxford Row, Bath, a former editor of the "Farmer's Veterinary Year Book," who died in November 23rd last, left £17,107 6s. 7d. gross, £16,977 4s. 4d. net value.

R.C.V.S. OBITUARY

The Late Mr. J. T. Allen, M.R.C.V.S.

Mr. John Thomas Allen, M.R.C.V.S., of 83, Station Road, Tunstall, whose death we recorded with much regret in our last issue, had been in practice for over 50 years in North Staffordshire.

Mr. Allen, who was 75, came of a Cheshire farming family, and, after qualifying as a veterinary surgeon, first practised in Burslem, and subsequently had additional surgeries at Stoke, Tunstall and Longton. *The Staffordshire Sentinel* records that his services as a judge, especially, of horses, were in great demand at shows throughout North Staffordshire and South Cheshire.

Services to Freemasonry

Mr. Allen was one of the best known Freemasons in the north of the Staffordshire Province. In the Craft he was a Past Master of St. Martin's Lodge, Burslem, and of the Ready Lodge, Burslem; a member of the Foster Gough Lodge, Stafford; and a Past Grand Warden of the Province of Staffordshire.

In the Royal Arch Degree he was a Past Principal of the Burslem Chapter and a Past Grand Standard-bearer of the Provincial Grand Chapter of Staffordshire.

He was also a Past Master in the Mark Degree of the Gough Mark Lodge, Hanley, and a Past Grand Deacon of the Province of Staffordshire and Shropshire. He was a member of the Ancient and Accepted Rite, having passed through the chair of the Stoke-on-Trent *Rose Croix* Chapter.

Mr. Allen was also a member of the Knights Templar Degree and a Past-Preceptor of the *Godefroi de Bouillon* Preceptory, Stoke-on-Trent, and a Past Standard-bearer of the Provincial Priory of Staffordshire, Warwickshire and Shropshire.

He had been a member for many years of the Stoke-on-Trent Rotary Club.

Mr. Allen, whose practice will be carried on by his partner, Mr. R. Wood, M.R.C.V.S., leaves a widow, one son, Mr. Gordon Allen, M.R.C.V.S., of Birmingham, and two daughters, Mrs. Loveless, of Frinton, Clacton-on-Sea, and Mrs. Regnauld, of Ashbourne. Deep sympathy is extended to them in their bereavement.

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NATIONAL CATTLE BREEDERS' ASSOCIATION

Dr. R. F. Montgomerie, President-Elect of the National Veterinary Medical Association, has been appointed chairman of the National Cattle Breeders' Association for the ensuing year.

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MORE EFFECTIVE DIPS

The Ministry of Agriculture Veterinary Department, after extensive trials, have approved benzine hexachloride sheep scab dips, which, it is claimed, dispense with the need for double dipping of sheep. The importance of the new dips resides in their potency over a period of two months. They are non-toxic.

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ROYAL COLLEGE OF VETERINARY SURGEONS

Animal Management Examination

List of Successful Candidates

(*Continued from Page* 240)

Edinburgh:

Baldwin, E. G.	Hurrell, A. D.
Barr, M.	Mainzer, G. H.
Borthwick, R. (credit)	Michniewski, J. R.
Brown, A. J.	Newsam, I. D. B.
Brown, T. C.	Philp, G. I.
Campbell, K.	Rashid, Admed
Caufield, W.	Skowronski, Z. Y. R.
Clark, S. T. (Miss)	Steele-Bodger, M. R.
Fraser, C. D.	Tarala, J. (credit)
Gilling, G. H. C.	Trought, V. P. T. (credit)
Gitter, M. (credit)	Warnes, W. E. J.
Gonzales, F. C.	Watkins, I. S.
Hildebrand, W. R. P. (credit)	Watson, D. A.

(*To be Concluded*)

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SIR JOHN ORR'S VALEDICTORY WARNING

Sir John Boyd Orr, who relinquishes his position as Director-General of the Food and Agriculture Organisation at the end of the present month, stated at a Press conference in London that for the

purpose of increasing production there was already a good organisation in the F.A.O. There were now two bodies, one a committee of 35 nations allocating food in accordance with need and the other stimulating plans of production. Never before had there been so many nations co-operating and planning together. Just previously, Sir John had taken occasion to issue "a last warning to the world" which he describes as rumbling on to destruction. This is because the world population is increasing by 20,000,000 yearly and there is no virgin soil to bring into use for food production; soil erosion is taking place all over the world, and the nations are squandering one-third of their national incomes preparing for the next war instead of applying the world's steel and industrial production to conserving the resources of the land.

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HORSE-MEAT "RACKET" ALLEGATIONS

In its issue of May 2nd, the *Sunday Mercury* (Birmingham) emphasises the need for action stressed by its contemporary, the *Birmingham Gazette*, in the extracts reproduced, under the above heading, in our columns on April 10th.

"Drastic Government action may soon be taken," says the *Mercury*, "against an ever-increasing black market in horseflesh, which is threatening many breeds of horses in the Midlands with extinction. With an abundance of spring grass, encouraging farmers to keep their animals for hay and corn harvesting, horses are temporarily in short supply. According to a member of the Licensed Horse Slaughterers' Association this shortage has made black market prices for horse flesh for human consumption rocket to four times the control price. Control price is 1s. a pound for best cuts and 8d. for other joints, all to be boneless."

Regulations Required

The *Mercury's* informant is quoted as saying: "The black market in this sort of meat is a menace to the horse population of this country. Unless many breeds of horses are to be wiped out, the Ministry of Food will have to implement regulations that the trade has been urging for years. During the war many slaughterhouses became redundant as a result of the Ministry of Food's policy of centralisation and many were taken over by people who created a thriving black market. It is quite clear that over 80 per cent. of horseflesh for human consumption goes to cafés, restaurants and pie-makers at up to—and above—three times the control prices. Much of this is not boneless as prescribed by the Order.

"The struggle to get something done in this business has been long and arduous. Practically the whole of the people in the trade before the war were members of the Association. This organisation has tried to keep the industry clean and free from any undesirable element.

"In 1938 suggestions were sent to the Ministries of Health and Agriculture based on the assertion that the Knackers' Act of 1786 and certain subsequent enactments had become unnecessary and obsolete. Had these suggestions been adopted they would have prevented many of the present black market activities.

"In 1942 there were more suggestions put forward to the Ministry of Food for the control of horseflesh for human consumption. These included the recommendations that horses killed for this purpose should first be certified by a veterinary surgeon as being unfit for economic use, that they should be slaughtered on premises licensed before the outbreak of war, and that all licences issued since the outbreak of war should be withdrawn.

"We also suggested that the maximum price per live cwt. should be fixed at roughly the standard price before the war and that horses for human consumption should be inspected by a veterinary surgeon and the meat stamped as being fit for that purpose.

"A prominent horse dealer in the Midlands told me that he feared that unsuitable meat is being consumed by human beings. 'I know a place where 14 horses a day are being slaughtered,' he said. 'There are plenty of horses in the country at the present time, but what are the prospects? Among the genuine buyers in markets and at sales it is a well-known fact that a two-year-old horse valued at £40 as stock is worth £10 more as black market meat.'"

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First International Congress of Physiology and Pathology of Animal Reproduction and of Artificial Insemination

Twenty-one nations have now appointed official representatives to the above Congress. Some 200 papers have already been submitted for presentation at the sessional meetings, at which the lecturers will include Professors G. Amantea (Italy), J. Anderson (Kenya), J. Guttierez (Uruguay), J. Hammond (England), G. Favilli (Italy), N. Lagerlof (Sweden), G. Lesbouvries (France), J. MacLeod (U.S.A.), E. J. Perry (U.S.A), R. Phillips (U.S.A.), G. Montalenti (Italy), G. Salisbury (U.S.A.), E. Sorensen (Denmark), G. Stefanelli (Italy) and S. Ranzi (Italy).

The symposium-conference organised by U.N.E.S.C.O., to be held on June 21st and 22nd, will be presided over by Professor S. Ranzi (Italy) and Professor A. Tyler (U.S.A.), and other participants will be Professors J. Brachet (Belgium), M. Hartmann (Germany), Min Chieh Chang (U.S.A.), A. Monory (Italy), G. Pincus (U.S.A.), Dr. J. W. Rowlands (England), Professors J. Runnstrom (Sweden), J. Seiler (Switzerland) and M. J. Sirks (Holland).

The opening meeting of Congress is to take place on June 23rd. Concurrently with the Congress there will be held a series of other events of much importance from the scientific and technical point of view. In addition, many interesting scientific and sight-seeing excursions will be organised, while much importance is attached to the international products and livestock exhibitions connected with the Congress.

A great number of subscriptions have been received from all countries of the world. Subscriptions should be forwarded to the Secretary General's office (Secretary General, Professor T. Bonadonna) in Milan, via Bronzetti 17. It is advisable to write direct to that office for all information.

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CONFERENCE ON HORSE BREEDING IN HOLLAND

We learn from the current issue of *The Horse and Pony*, the official publication of the British Horse Society, that the Society has been invited by the Royal Netherlands Embassy to participate in a Conference on September 6th to 8th, at Utrecht, synchronising with the International Industries Fair, when the Horse Show will also be held to celebrate the 50th year of the reign of Queen Wilhelmina. The Conference will specially study the different aspects of breeding horses for agricultural purposes.

The Embassy hope that the Society will be represented, and the Ministry of Agriculture has suggested that it should provide reports required on the following subjects:—

Legal measures in the field of horse breeding.
The stud book, selection and inspection.
The determination of the utility value as a method of selection and its significance with regard to mechanisation.
Fecundity and sterility.

Lord Digby, provided his engagements permit, has accepted an invitation to represent the Society.

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LONDON CART HORSE PARADE

One of the most popular events in London on a Whit-Monday favoured with ideal weather for such a spectacle was the London Cart Horse Parade Society's annual show in Regent's Park. It was the 52nd parade, and the entry of 249 horses compared with 238 last year and 231 in 1946. Horses of the Shire type were the most numerous, and some splendid animals amongst these, the Clydesdales and the Suffolks drew applause from the crowd.

The judges took into consideration horse, van, harness, and general appearance, having regard to the competitor's trade or business. Awards were also made for long service, as many as 30 of the drivers present having had over 30 years with the same employer. The biggest individual entry came from British Railways, London Midland Region. Coal merchants and brewers were also well represented.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Sheep Scab:

Cumberland.—Syke Beck Farm, Bootle, Cumberland (May 13th).

Lancs.—Chestnut House Farm, Pilling, Preston, Lancs. (May 13th).

* * * * *

The Earl of Huntingdon, Parliamentary Secretary, and officials of the Ministry of Agriculture and a number of well-known veterinarians and agriculturists, attended the showing, on April 21st, of two films, "Sterility" and "Hygiene on the Farm," made for the Animal Health Trust as part of its veterinary educational programme. "Sterility" was accepted for display at the annual film exhibition of the Royal Photographic Society last year.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

Correspondents are requested to write as briefly as possible

SOME FURTHER OBSERVATIONS ON THE USE OF PENICILLIN IN CANINE LEPTOSPIROSIS

Sir,— In the light of our claim in a previous communication that pencillin appears to be a specific in primary uncomplicated *Leptospira canicola* infection in the dog, it is now felt that certain observations we have made comparing these results with those obtained by its use in *Leptospira icterohaemorrhagiae* infection may be of value in clarifying the position as it appears to us at present. The object of this note is solely to interpret our findings in respect of penicillin therapy.

There appears to be a fairly frequent occurrence of a non-icteric, predominantly renal form of the latter infection in which the response to penicillin therapy is poor or absent, which fact, owing to the difficulty of differential diagnosis in the early stages, may cause clinicians to doubt the claims we put forward as to the use of that agent in *L. canicola* infection.

In our practice areas leptospirosis has appeared to be markedly seasonal in incidence, the great majority of our cases occurring from November to April, both months inclusive.

During the season November, 1947 to April, 1948, cases of both canicola and icterohaemorrhagiae infection have been seen. In the former penicillin has consistently given the spectacular results we claimed in its use last year and we are now of the opinion that administration of penicillin for a period of seven days is sufficient to obviate the danger of relapse provided that complete clinical recovery has occurred in that time. In addition a number of cases of *L. icterohaemorrhagiae* infection have been seen showing a predominantly renal syndrome comprising inappetence, occasional vomiting, acute depression, brownish discoloration of the tongue, uraemic odour from the mouth and slight elevation of temperature, (usually 102·4 to 102·6° F.) Enlargement of the kidneys to palpable dimensions may be a feature with either oliguria or thirst and corresponding polyuria. No icterus has been noted in this type of case, nor indeed any symptoms of a hepatic type. There appears to be no feature which serves to differentiate such cases from the similar group of sub-acute types of *Leptospira canicola* infection in the early stages. As agglutinins may not be detectable in serum for ten days after infection, no assistance can be expected from this test, and it may not be for some weeks that the specific and para-specific titres differentiate sufficiently to allow differential diagnosis as between canicola and icterohaemorrhagiae infection to be made. It has, however, been our experience that in cases which eventually prove on repeated serum testing to give a higher titre to icterohaemorrhagiae the response to penicillin therapy has been either slow or absent; it in no way compares with the spectacular response which occurs in canicola cases. Although a fairly high proportion of our cases have recovered after a course of penicillin treatment some have died in spite of treatment which were yet not so markedly uraemic that we have considered them to be hopeless at the outset. In the majority of cases which recovered, response to penicillin was delayed and noticeable improvement occurred only three to four days after the initiation of penicillin therapy, in marked contrast to canicola cases where dramatic improvement occurred within 24 hours. It seems to us that if the response to penicillin in a case diagnosed as leptospirosis is only slight after 48 hours, it may be desirable to reinforce this line of treatment by administration of anti-leptospira serum, a course which we now adopt.

These findings are in line with those in human medicine where there is said to be little difference in the response of cases of Weil's disease to serum or penicillin treatment, which is further confirmed by work on experimental icterohaemorrhagiae infection in guinea-pigs. It seems, therefore, that *L. canicola* is far more susceptible to penicillin than *L. icterohaemorrhagiae* in natural infection in the dog and comparison of a similar nature in other species would be of interest.

Yours faithfully,
MARION J. FREAK, Potters Bar.
JOAN O. JOSHUA, Finchley.

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VACATION PRACTICE FOR STUDENTS

Sir,—As the President of the N.V.M.A. so rightly pointed out in his letter to *The Veterinary Record* dated March 8th, 1948, students are finding increasing difficulty in arranging to see practice during the vacation.

Consequently, I have been directed by the members of the Association of Veterinary Students to write to you, in the hope that any practitioner who would be willing to accept students would be kind enough to forward his name and address to "The A.V.S. Representative, Royal (Dick) Veterinary College, Edinburgh, 9," who would then be in a position to compile a central register for the use of all veterinary students.

It was also suggested that practitioners might like to indicate:—

1. The type of practice.
2. Whether they would be willing to accept men and/or women students.
3. Whether a fee would be charged, and if so, how much?
4. Alternatively, whether they would be prepared to pay the students for such work as the latter might undertake. This would apply particularly to fourth and fifth year students.
5. Whether students of a particular year are preferred.
6. Whether accommodation would be available or not.
7. The number of students who could be taken at any one time.

Yours faithfully,
J. F. HARBOURNE,
Hon. Secretary, Association of Veterinary Students.

The University of Liverpool,
Veterinary Anatomy Building,
Bedford Street North,
Liverpool, 7.
May 5th, 1948.

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THE CANINE NURSE

Sir,—I am following with interest, and a sardonic smile, the discussions published in *The Veterinary Record* on the foundation of new hospital services and "quackery." Perhaps the view of a canine nurse might not be out of place at the present time.

It is at least encouraging to think that perhaps some day a fully trained and competent nurse will receive a higher wage than the little girl from the Labour Exchange who "can do anything with animals."

At the present time there is no such distinction. Time and time again the writer has been asked the question "why did you not qualify as a veterinary surgeon?" This question is asked because the writer is reasonably intelligent—much too intelligent supposedly to be working for a vet. at such a small wage; any little girl from school should be taking that on—one who is not quite bright enough for much else.

How strange that Matrons and Sisters in hospital are allowed nursing, as distinct from being doctors, as a career and that they are regarded as such important members of the Medical World!

The real veterinary nurses, Mrs. Cole-Powney, with *no* encouragement, regard themselves in the same light. They are less tolerant of the unqualified practitioner, by far, than the veterinary surgeon himself. They are safe to be entrusted with all the equivalent duties of the human nurse and, incidentally, relieve the busy practitioner of a great deal of the less specialised though necessary treatments, by their "quackery."

A nurse in a small-animal practice is bound to work long and arduous hours. She must be alert for any situations that may arise. She must deal with difficult clients. She must deal with difficult animals. She must deal with the telephones, the doors, the emergency cases, the cleaning, the feeding, the dispensing, the *observing*.

Now that large hospitals are being suggested, the need for trained staffs has been stressed as all important; it has been suggested by one member of the profession that women should be properly trained and given proper recognition at the end of training; that if they had decent status and decent recognition "one could obtain an adequate and efficient staff."

I suggest that many such harassed members might do well to give that "decent recognition" *now*, in their own small hospitals, for it is high time that the profession as a whole were given a jolt in that direction.

Though the dreamt-of training hospitals are yet unborn I would remind the dreamers that the canine nurse *does* exist already—but she does so solely from her love of animals and loyalty to the veterinary profession. The former only, furnish the reward worth having.

Yours faithfully,
RACHEL PHILLIPS.

433 Glossop Road,
Sheffield, 10.
May 1st, 1948.